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AUTHOR Ellson, Douglas G.; And Others
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ABSTRACT

The Regional Center for Educational Innovation and Technology (INNOTECH) of the South East Asian Ministers of Education Organization (SEAMEO) evaluates its self-instructional program for English listening comprehension in this final report. The program was designed for students whose English language proficiency does not enable them to follow courses at INNOTECH, which are conducted in English, and it was intended both to develop their listening skills in technical English and to expose them to part of the actual INNOTECH curriculum. The course consists of 50 units recorded on cassettes, each with an oral passage of 200-800 words lasting from two to eight minutes. The tapes are supplemented by printed material which includes questions, answer keys, transcriptions of the texts, and step-by-step instructions for the program. The course was found to be effective in improving the aural comprehension of technical English at least as much as the former program which involved five months of classroom instruction. In addition, the report emphasizes its economical aspects; programmed materials and cassettes are used rather than teacher time and more expensive recording equipment. Included with the report are two appendixes; one gives the introduction and instructions from the program material and the other gives samples of the printed program material. (HW)

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INNOTECH/TP-FR/73



REGIONAL CENTER
FOR EDUCATIONAL
INNOVATION AND TECHNOLOGY

THE TECH PROGRAMME

A SELF-INSTRUCTIONAL PROGRAMME
FOR
ENGLISH LISTENING COMPREHENSION

FINAL REPORT

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

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THE TECH PROGRAMME

A Self-instructional Programme
for English Listening Comprehension

Douglas G. Ellson
Chiam Tah Wen
Le Thi Kim Hai

May, 1973

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We wish to express our gratitude to the INNOTECH interns of 1971-72 and 1972-73 for serving as subjects in the experimental evaluation of the Tech Program, especially to those in the 1972-73 group who completed the entire set of 50 units even though their English was almost beyond improvement. They had little to gain for their effort beyond the satisfaction of contributing data necessary for the development and refinement of the program and thus indirectly to the improvement of the English comprehension skills of those who later make use of it. Beyond this, a direct contribution to the research was made by the following interns from the 1971-72 group who took part in a training project which developed an initial form of the program:

R. Ibrahim
Tea Meng Tech
Douang Nophalay
Chiam Tah Wen

Dorai Natarajan
Roj Dulyakorn
Nguyen Dang Phuong
Trinh Viet Thai

Miss Helen Manampan of the 1972-73 group also contributed a point-by-point analysis of the content and questions of the original 50 units and the program as a whole which was utilized extensively in making the final revision.

Much credit is due to the administrative staff who made the recordings and typed the texts, and then patiently did much of their work over again to accommodate the many revisions between first and final drafts of the program.

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Douglas G. Ellson

The TECH Program: Technical English Comprehension (Hearing)

The Aim

The initial aim in developing the TECH Program was to provide an economical means to train participants in Innotech's Training Programs in the comprehension of spoken technical English. A secondary aim, introduced during the development of the program was to provide an introduction to the content of the Innotech curriculum.

The Problem

Although English is the announced medium of instruction in Innotech training programs, a significant proportion of the participants fail to gain full benefit from these programs because of inadequate proficiency in English. Although all participants from the non-English speaking SEAMEO countries have had sufficient training in English to converse in that language when they first came to Innotech, a high proportion have difficulty in following lectures or in taking part in discussions at the required technical level. For approximately half of the trainees test scores indicate that further training in English is necessary before participation in programs such as Innotech's can be fully effective. A similar problem is encountered in all of the SEAMEO Centers, and the problem is, of course, world-wide: it is common to thousands of students who go abroad to study in a language not their own.

The problem was discussed at length at the 7th SEAMEO Conference held in Vientiane in January 1972, and it was recommended that all of the SEAMEO Centers should provide, "for those participants who need it, an intensive 2 week course in English before the commencement of the training/research programme, as well as arrange for the tutoring in English of such participants during the first two weeks of their courses." Further, SEAMES was instructed "to explore the feasibility of providing funds to meet the costs for board and lodging incurred in the two-week intensive courses in English for participants at the Centers."

For a number of reasons the proposal was not feasible. Funds were not available to meet the costs of holding the proposed training programs at the Centers, qualified instructors were not available at some Centers, and experts questioned the effectiveness of a course lasting only two weeks. One alternative, to utilize existing language centers to train participants before they departed from their home countries, had other disadvantages. Few training courses of the necessary type and level were offered; schedules did not match those of the Centers and some of the courses required as much as 9 months full time; few courses were available outside the capital cities and, of course, many of the participants come from outlying areas.

A feasible alternative appeared to be a self-instructional program which would minimize staff requirements and which could be administered anywhere at the convenience of the user. The fact that a suitable program was not available readymade was not necessarily a disadvantage: a program developed locally to solve the immediate problem could be tailored to the special needs of the participants and the Center involved. In particular the content of the program could be designed to combine an introduction to the Center's curriculum with the required training in English comprehension.

In consequence the Tech Program was designed to provide:

- a. self-instruction in comprehension of oral technical English
- b. an introduction to material in the Innotech curriculum
- c. portability and
- d. economy

Development of the Program

The program was developed in three phases, each involving a significant revision of the procedural and content programs.

Phase I: April-June, 1972. Small scale tryout of a preliminary form of the program.

Exploratory work was begun as a training project carried out by eight of the 1971-1972 group of Innotech interns. Considerable motivation was provided by one of the interns, Mr. Tea Meng Tech, Inspector of Primary School, Directorate of Instruction, Khmer Republic. Mr. Tech had previously developed a similar program for his own self-instruction based on radio broadcasts in standard and Special English.

The initial work of the interns produced a preliminary operational program (specification of the learning procedure) and a format for the teaching materials. The materials for each lesson or unit consisted of a short talk and oral questions concerning it reproduced on a cassette tape, together with a booklet containing the same questions in printed form, a printed transcript of the talk, and instructions specifying the step-by-step procedure. On the basis of a tryout in which the interns served as experimental subjects the operational program was simplified. The tryout also indicated that initial estimates of the appropriate length for recorded passages and the difficulty level of the questions were too high.

Phase II: September 1972-February 1973. Development and tryout of the revised operational program and a 50-unit content program.

On the basis of the initial tryout and other considerations the operational program was simplified and a 50-unit content program (syllabus) and the material required to teach it were written. The new program was given to 15 of the 16 members of the 1972-73 group of interns beginning in September, shortly after their arrival at Innotech. (One member of the group who has had almost no training in English before coming to Innotech declined.) The 50 units, each of which required a maximum of 1 hour's work, were completed in approximately 90 working days over a 4-month period.

A number of changes were introduced in the program during this tryout. The full set of program materials was not in final form before the tryout began; materials for later programs were being selected and questions

written as earlier units were being administered. The performance and comments of the learners together with experience gained during the writing of questions indicated that 8 good questions which met the criteria for length and technical level could not be derived from the available texts. Consequently, after the 20th unit the number of both essay and multiple choice questions per unit was reduced from 8 to 5.

Initially the program included oral questions recorded on the tape, with the same questions repeated in printed form. After experience with a few units the oral questions were eliminated together with the procedural steps which utilized them. The operational program was also simplified in other minor ways.

Phase III: February-April, 1973. Final Revision.

This phase was begun after all interns had completed the 50 units. The final revision was based on a detailed critical analysis of the entire program. The performance of the English-proficient participants provided useful information concerning the difficulty of questions and text content. Revisions include:

- (a) re-ordering of the units
- (b) elimination of 3 unsatisfactory units and the inclusion of 3 units specially written to provide simpler material at the beginning of the program
- (c) reduction of the number of questions from 8 to 5 in all units
- (d) revision of the instructions
- (e) revision of the printed format
- (f) editing of questions and texts and
- (g) elimination of discrepancies, mostly typographical, between the oral and printed texts.

After elimination of oral questions, no major changes in the operational program were found necessary.

The Program

The program which resulted from this process of development consists of 50 units of material in the areas of educational development in Southeast Asia, the systems approach, innovation and educational technology.

The texts were selected from material in the Innotech file and library, including technical articles, seminar reports, etc.

The criteria used to select the material were:

- (a) Coherence and unity
- (b) Suitability for the development of questions on content
- (c) Length - 2-8 minutes, 200-800 words
- (d) Relevance to Innotech training program

The texts were recorded orally on tape in a variety of voices of native English speakers, men and women, with British and American accents. They were read so as to simulate a seminar or lecture presentation but rather more slowly and distinctly.

The material for each unit consists of a short oral passage recorded on a cassette tape, supplemented by printed material which includes questions, answer keys, a transcript of the recorded text and step-by-step instructions. Answers to the questions are recorded on expendable answer sheets, one required per unit. The format was especially planned to fit the requirements of the operational program.

The overall program is conveniently described separately under two headings, which represent those aspects of the program which control the how and the what of learning. The operational program specifies how -- it is the procedure which the learner follows in completing each unit of material. The content program is the sequence of learning material and tasks which largely determines what the student learns. Details of the two types of program follow:

A. Operational program (see Figure 1,

The operational program, which is the same for each unit, is essentially a study guide in the form of a seven-step branched program on the brightening model. The brightening model begins with a test, which presents the task to be performed in its most difficult form. If the learner can not perform the task it is made progressively easier by repeating or elaborating the instructions, presenting the task in a simpler form, by providing additional information, etc., until the learner succeeds. At this point the learner is presented with another task which is similarly simplified if he can not perform it. The brightening model, also known as the "discovery method" is the inverse of the fading model and the conventional teach-then-test classroom procedures which favor learning by rote rather than by problem-solving.

In each unit of the Tech Program the initial task is a relatively realistic representation of the situation the student is being trained to face--he listens to a single presentation of oral material presented once, after which he is required to demonstrate that he understood what he heard by answering essay-type questions about it. If he fails, the task is progressively simplified by allowing him to listen again, by substituting multiple choice questions and by allowing him to read a transcript of the oral material. The procedural program which specifies the steps in this process in detail is summarized in Figure 1.

B. The content program (see Figure 2)

The content of the 50 units is suggested by their titles, which are listed in Figure 2. In addition to the recorded selection, each unit includes a set of 5 essay questions, 5 multiple-choice questions, answer keys and the printed text of the recording, all imbedged in the instructions which specify the operational program.

Texts were selected from material in the Innotech file and library, chiefly technical articles and reports given at seminars and other

Figure 1

The Operational Program:

Summary Instructions for Each Unit in the TECH Program

- STEP 1: Listen to the tape once, without interruption.
Take notes if you wish.
- STEP 2: Answer the 5 essay questions (QA).
- STEP 3: Listen to the tape again, several times if necessary, and
revise or complete your answers to QA.
- STEP 4: Mark unacceptable answers to QA, using the answer key.
If you made no more than one error, go to the next unit.
If you made two or more errors, go to STEP 5.
- STEP 5: Answer the 5 multiple choice questions (QM).
- STEP 6: Mark incorrect answers to QM, using the answer key.
If you made no more than one error, go to the next unit.
If you made two or more errors, go to STEP 7.
- STEP 7: Read the text as you listen to the tape again.
Use an English and/or dual-language dictionary if necessary.
Find the answers to QA and QM questions that were marked
incorrect.
On your answer sheet beside each question missed write the
numbers of the lines in the text on which you found the answer
to it.

END

Figure 2

The Content Program

List of TECH Program Units

Introductory Units

- Unit 1: Training Unit: How to Be a Better Minister of Education
- Unit 2: Educational Technologies
- Unit 3: Teaching Technologies and Educational Systems

Educational Development and Innovation

- Unit 4: A New Approach
- Units 5 & 6: Educational Development in Southeast Asia: Methods of Change.

Systems Approach

- Units 7 & 8: Introduction to the Systems Approach
- Unit 9: The Systems Approach to Education

Instructional Objectives

- Units 10-12: Instructional Objectives

Alternatives

- Unit 13: Alternatives in Education

Educational Technology

- Units 14 & 15: Educational Technology

Educational Television

- Units 16 - 18: What the Research on ETV Says
- Units 19 - 22: Television Reconsidered
- Units 23 - 25: Review of Schramm "TV Reconsidered"
- Unit 26: Educational Television in Singapore

Programmed Learning

- Units 27 - 34: Characteristics of Programmed Learning
- Unit 35: The Pacific Horizons Reading Scheme

Evaluation

- Units 36 & 37: Introduction to "Evaluation in The Systems Approach"
- Units 38 - 43: Evaluating Training and Development Systems

Objectives

- Units 44 - 47: Defining Objectives for Six Varieties of Learning
- Unit 48: Objectives-Based Accountability Procedures for Classroom Use.

Teaching Principles

- Units 49 - 50: Aptitudes or Specific Skills?

meetings. These were recorded orally on tape in eight voices of native English speakers, both men and women, with British and American accents. They were read so as to simulate a seminar or lecture presentation but rather more slowly and distinctly. The criteria used to select the material were:

- a. Subject matter area: The area defined by the curriculum of Innotech training programs and topics in closely related fields, especially topics of general interest.
- b. Subject matter level: Introductory tertiary, suited to interested non-specialists such as university-level students entering the field or professionals in related fields.
- c. Language level: Tertiary--Assume secondary-level training in English and a relatively large reading vocabulary. Suited to the educated non-specialist: technical terms and concepts are introduced, explained and defined in non-technical language.
- d. Coherence and unity: The material should be complete and understandable in itself, with minimal dependence on special knowledge or context from previous units. Units may, however, be parts of a larger whole such as that represented by a series of units on the same or related topics.
- e. Content: Sufficient material and specificity to permit the formulation of clear and answerable questions, 5 essay-type and 5 multiple-choice, with duplication of content in the two types permitted.
- f. Length: 2-8 minutes of oral presentation (200-800 words).

Questions were constructed with the aim of establishing useful listening and study habits. Although questions on specific detail were not excluded, comprehension rather than memorization was emphasized. In addition to reproduction of detail, questions were included systematically to require comprehension of the following kinds:

- a. Identification of the main theme or thesis of the text or the author's aim, attitude, bias or emphasis. (Care was taken that questions of this type could not be answered from the title of the unit. In many cases an obviously descriptive title was replaced by a general or noncommittal one to avoid giving away an answer to this type of question.)
- b. Analysis of hierarchies and outline.
 - 1. Listing of major topics or sub-headings
 - 2. Distinguishing main and sub-topics
 - 3. Relating major points to illustrations and examples
 - 4. Giving examples and applications of generalizations, from within or outside the text
- c. Identification of cause and effect relationships
- d. Interpretation:
 - 1. Summarization
 - 2. Identification of word-meanings from context
 - 3. Classification
 - 4. Comparison (similarities, differences)
 - 5. Illustration, exemplification
 - 6. Explanation
- e. Translation (of words, idioms, phrases, sentences) into equivalent English forms.
 - 1. Recognition and production of synonyms, equivalent terms, phrases, etc.
 - 2. Definition

Evaluation

Evaluation of the program is based primarily on the performance of an experimental group of 15 Innotech interns who completed the 50 units in the 4-month period between September 27, 1972 and January 23, 1973. The pre- and post-test performance of this group on the Michigan Test of Aural Comprehension was compared with that of a control group consisting

of 13 of the interns from the previous year who had been given the same tests on approximately the same dates and stages of their training.

Although the program was designed for use by persons with a deficiency in English, the validation groups included those with no deficiency. Scores for the experimental group on the Michigan Test, administered during the week preceding the start of the program ranged from 20% to 98%. Of these, scores for nine interns were below 80%, indicating, according to the test manual, "considerable handicap in understanding spoken English." Scores for seven of the nine were below 70%, which the manual interprets as follows:

Students in this range are not ready to undertake academic work in an environment where English is the medium of instruction. Those at the upper limit of this range may know enough English to travel, but they will not ordinarily be able to go into academic work until they have devoted some time exclusively to the study of English

Effectiveness of the program was evaluated in terms of (a) improvement in the performance of the experimental group on the 50 program units, (b) gains on the Michigan Test compared with gains achieved by the control group and (c) reactions to the program of interns in the experimental group.

a. Performance on the program units is evaluated in terms of errors on essay questions only. Results obtained for multiple choice questions were not meaningful since the number of subjects responding to these questions was not constant. Multiple-choice questions are answered in the course of the program only if the learners make two or more errors on the essay questions.

The number of errors shows a progressive decrease throughout the program (see Figure 3). Much of the variability from unit to unit may be attributed to differences in the difficulty level of unit content or questions.

There is some evidence that the amount of improvement indicated by the general trend of the data in Figure 3 is under-estimated. Units 6 and 46,

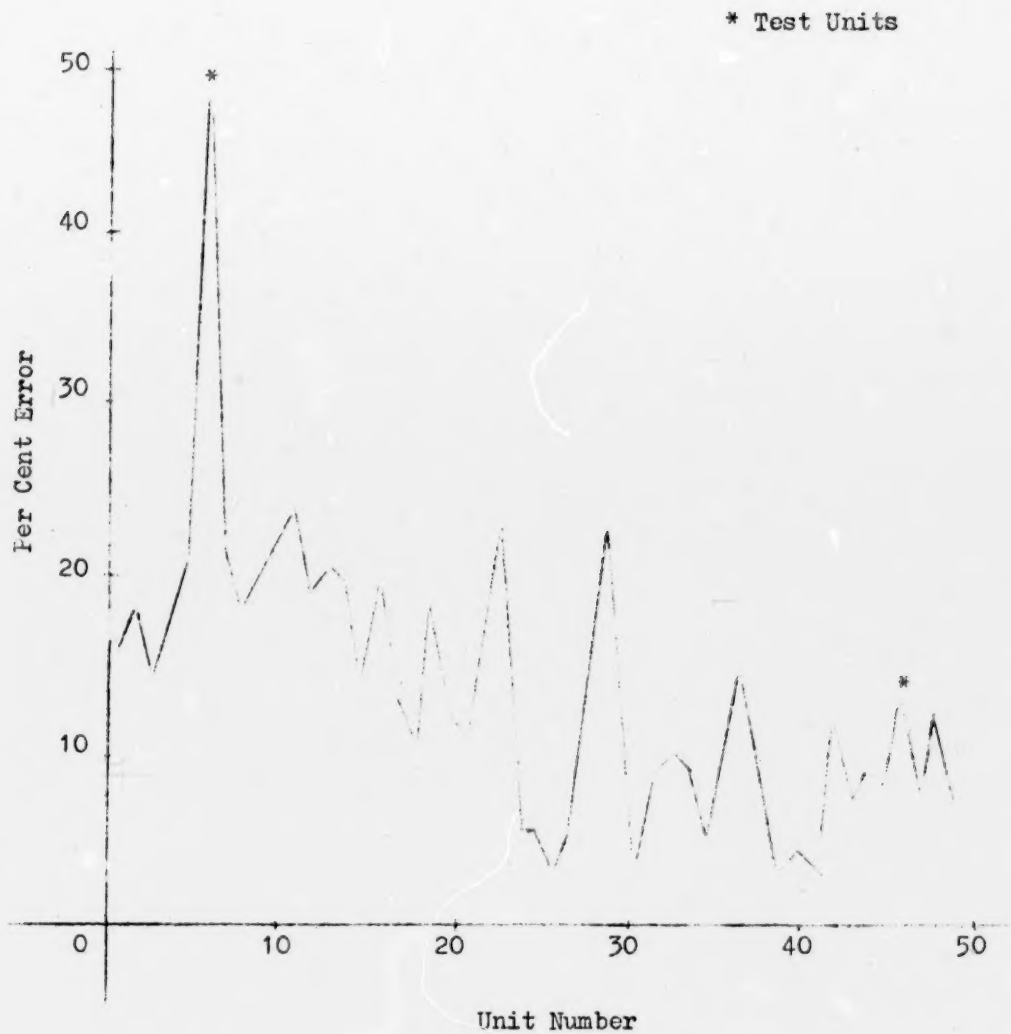


Figure 3
Progress Indicated by Per Cent Error on Essay Questions

starred in Figure 3, were given under special test conditions to insure comparability. Early in the program it was discovered that some of the participants were deviating from the instructions. In order to increase their scores on what some persisted in viewing as an examination rather than a teaching device, some of the participants habitually stopped the tape to provide additional time for note-taking, listened to the tape several times or even referred to the answer key before answering the essay questions. To demonstrate the effects of these practices, the essay questions of Unit 6 were presented to the participants as a group under the conditions prescribed by the program, i.e., they were required to answer the questions after a single uninterrupted presentation of the recorded passage. As Figure 3 shows, when this was done the percentage of errors increased markedly, from approximately 20% on Units 1-5 to 50% on Unit 6. On Unit 46, administered three months later under similar test conditions the proportion of errors was 15% and a comparable increase did not occur. The improvement indicated by the relative performance on the two controlled tests is considerably greater than that indicated by the scores on other units obtained under less controlled conditions.

- b. The second form of evaluation is based on pre- to post-test gains on the Michigan Test of Aural Comprehension. One form of the test was given to both groups when each first came to Innotech and a second form was given approximately 4 months later, in February. The experimental group (1972-73) completed 50 units of the TECH Program in the interval between the two tests. In the control group of 13 interns (1971-72) seven interns with pretest scores below 70 (indicating a serious deficiency in English) were given a special English-language training program. This program is summarized in the AIR "Report of the Technical Advisory Services Provided to Innotech", January, 1972, p.8:

Innotech attempted to solve the problem by holding sessions for the complete group (of 16 interns) in the morning and then

splitting the group in the afternoon. The "English-training" group (seven interns) reviewed the morning sessions and worked on English-training exercises developed from basic Innotech reading while the "English-proficient group" began work on projects.

... one staff member was occupied full-time with the English program.

Pre- to post-test gains are shown in Table 1, (a) for the total groups and (b) for those subjects whose English was deficient as indicated by pre-test scores below 70. In both comparisons gains were greater

Table 1

Pre to post-test gains on the Michigan
Aural English Comprehension Test

	<u>Experimental (1972-73)</u>				<u>Control (1971-72)</u>				<u>Diff.</u>
	N	Pre	Post	Gain	N	Pre	Post	Gain	Diff.
Total Group	15	69.7	75.6	5.9	13	73.1	77.2	4.1	1.8
English deficient	7	50.3	65.7	15.4	6	58.7	65.9	7.2	8.2

for the experimental group, but gains for the total groups differed only slightly. For the English-deficient, gains for the Tech-trained group were nearly twice those for the control group. However, the number of cases was small and the difference was not statistically significant.

- c. Less objective evidence is provided by the attitudes of the participants in the program whose English was deficient. With the exception of two who appeared not sufficiently motivated for self-instruction their attitudes were favourable. This subjective evaluation of attitudes is supported by twelve requests from persons who have purchased the necessary cassette tapes to have copies of the program made for their own use. Others whose English was initially adequate have requested copies of the printed texts and questions.

Conclusions

The available data do not provide conclusive evidence for the effectiveness of the TECH Program. Performance on the program itself showed progressive improvement but only part of it can be attributed to the program, since the learners were simultaneously participating almost full-time in an English-language environment. The relatively large difference in favor of the TECH Program group in the experimental-control comparison is more convincing, but the number of cases was too small for the difference to be significant. A more extensive validation study is indicated. However, in both cases the data are consistent with the conclusion that the program improves the comprehension of technical English. It was at least as effective as a conventional program used at Innotech in the previous year. The latter program required classroom space and occupied the time of one professional staff member for a period of five months. To administer the TECH Program requires the part-time services of a clerk and minimal space for storage. The program has high face validity and in the judgment of many participants it was valuable for learning both language skills and subject matter.

Thus, there are a number of indications that the program is an effective aid to learning English comprehension skills and curriculum content, and that it is at least as effective for achieving these objectives as a conventional program which had greater manpower and space requirements and is less portable.

APPENDICES

- I. Introduction and instructions from the program material.
- II. Samples of the printed program material (Programs 5 and 36).

APPENDIX I

Introduction and instructions from the program material

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Introduction

TECH is a self-instructional program to improve the understanding of technical English. It is not intended for beginners; it is designed for those who already read, speak and understand English well enough to carry on a conversation and to find their way around in an English-speaking country, but who do not understand spoken English well enough to follow technical lectures and discussions. The name TECH is an acronym for Technical English Comprehension (Hearing). The letter T could just as well stand for Tertiary, to indicate that TECH is a university-level training program for those who have completed their training in English at the secondary level.

The program includes 50 units of material, each of which consists of a short talk on a cassette tape, a printed transcript of the talk, essay and multiple choice questions, answer keys and a set of instructions which indicate how to use this material most effectively. The content of the talks is related to the curriculum of Innotech training programs: the topics discussed include educational development in Southeast Asia, innovations in education, the systems approach, evaluation and educational technologies such as ETV and programmed instruction.

To make the best use of this material the program should be followed exactly. This program or study guide has been designed very carefully on the basis of tested principles of skill-learning and it has been tried out and modified repeatedly to improve its convenience and effectiveness for developing the skill of understanding technical English as it is spoken by native speakers.

Materials

Materials required for the TECH program include:

1. A standard cassette tape player. The recording feature that most tape players include is not used for the TECH program.
2. 25 TECH program cassettes, each of which presents the recorded material for two units, one unit on each side. The recorded material for each unit is a short talk, 2 to 8 minutes in length.
3. The TECH BOOK, which contains, in addition to the introduction you are now reading, the printed material for 50 TECH units. This includes, for each unit, 5 essay questions and 5 multiple choice questions with answer keys for each and a printed transcript of the recorded material.
4. 50 answer sheets, one for each unit (see next page for the format of the answer sheet). If answer sheets are not available blank sheets may be used. In that case it is convenient to arrange the answers as on the answer sheets, leaving the necessary space for marking wrong answers and the numbers of the lines in the text where the answers may be found.
5. Pen or pencil and paper for taking notes on the recorded talks.

TECH Program Answer Sheet

Name _____ Date _____ Unit _____

	QA Answers	QA Lines	QM Ans.	QM Lines
1.	_____			
	Revision _____			
2.	_____			
	Revision _____			
3.	_____			
	Revision _____			
4.	_____			
	Revision _____			
5.	_____			
	Revision _____			

Program Summary

There are seven steps in the program:

Summary Instructions for Each Unit in the TECH Program

- STEP 1: Listen to the tape once, without interruption.
Take notes if you wish.
- STEP 2: Answer the 5 essay questions (QA).
- STEP 3: Listen to the tape again, several times if necessary,
and revise or complete your answers to QA.
- STEP 4: Mark unacceptable answers to QA, using the answer key.
If you made no more than one error, go to the next unit.
If you made two or more errors, go to STEP 5.
- STEP 5: Answer the 5 multiple choice questions (QM).
- STEP 6: Mark your answers to QM, using the answer key.
If you made no more than one error, go to the next unit.
If you made two or more errors, go to STEP 7.
- STEP 7: Read the text as you listen to the tape again. Use an
English and/or dual-language dictionary if necessary.
Find the answers to QA and QM questions that were
marked wrong. On your answer sheet beside each ques-
tion missed, write the numbers of the lines in the
text on which you found the answer.

More specific instructions and explanations for each step follow.

Detailed Procedures

Step 1: Listen to the tape once, without interruption.
Take notes if you wish.

Prepare to answer questions concerning the general purpose and major points made by the speaker as well as questions on specific details.

Do not stop the tape or listen to it a second time before answering questions in Step 2.

Step 1 begins the program with a realistic presentation of the situation you will face at Innotech or in any academic or training program where instruction is conducted in English - you will be expected to understand lectures or discussions that you can hear only once. In the real situation you can take notes, but you cannot slow down the speaker or expect him to stop and wait while you take notes and you can not expect him to repeat what he says for your benefit. This is the situation reproduced in Step 1. After listening to the talk once as Step 1 requires you will very likely find that you do not understand it fully; you will probably not be able to answer all of the questions satisfactorily when you reach Step 2. This does not mean that you should listen to the tape more than once or stop the tape to take notes.

If you did this you could probably answer more questions correctly on Step 2, but you would not be learning to understand spoken English under realistic conditions.

If your purpose in taking the TECH program were to get a high score or to memorize answers to the questions, you could do much better by skipping Step 1 entirely, for

example, by looking at the answer key as in Step 4 or by reading the text as in Step 7 before answering the questions in Step 2. But this is not your purpose in completing the TECH program - your purpose is to learn to understand technical English when you first hear it. To learn this skill you must not take short-cuts which enable you to answer questions without practicing the skill itself. For this reason you should follow the instructions for the program exactly.

Step 2: Answer the 5 essay questions (QA).

Answer each question in the first two lines provided in the answer sheet. The second two lines marked "Revision" are to be used for changes or additions to your answers which you may wish to make later after listening to the tape again in Step 3.

Do not try to answer in complete sentences. Your answers should be very brief, one or two words or a phrase. If you require more than two (or even one) lines to express your meaning you have probably missed the point.

Step 3: Listen to the tape again, several times if necessary, and revise or complete your answers to QA.

Write your corrected answers on the lines marked "Revision" on the answer sheet.

Step 3 is designed to give you more practice in listening to spoken English. The task this time is easier, you may listen several times and, since you have read the questions, you know what to listen for. In the process of revising your answers through listening a second or third time you will hear things you missed the first time, and understand more.

Step 4: Mark unacceptable answers to QA, using the answer key.

If you made no more than one error, go to the next unit.

If you made two or more errors, go to Step 5.

Mark omitted or unacceptable answers with an X. To be acceptable your answer need not be in the same words as the answer key. Your answer is acceptable if the words you wrote have the same meaning as the words in the answer key. It is not acceptable to say, "Oh, I knew the right answer - I just did not write it down correctly". If you did know the answer, why did you write something else?)

Step 4 provides you with "feedback" in the form of information that your answers were right or wrong, which is extremely important for efficient learning. If you answered all or all but one of the questions acceptably,

you have probably learned all you can learn from the task presented. In that case, you should go on to the next unit. If not, you need additional work. Perhaps you did not understand some of the words or idioms, or you could not express yourself well enough to answer the essay-type questions.

Step 5: Answer the 5 multiple choices (QM).

Write the letter a, b, c, or d under QM Answer on the answer sheet.

Step 5 presents a second set of questions in multiple-choice form, which are easier than essay questions since they test your understanding without requiring you to express yourself in English.

Step 6: Mark your answers to QM, using the answer key.

If you made no more than one error, go to the next unit.

If you made two or more errors, go to Step 7.

Mark wrong answers with an X.

Step 6 again provides feedback. If your answers on Step 5 indicate that you understood what was presented in the talk, you are ready for the next unit. If you failed on Step 5 after listening to the talk several times in Steps 1 and 3, it is not likely that listening again under the same conditions will improve your understanding.

Step 7: Read the text as you listen to the tape again. Use an English or a dual-language dictionary if necessary. Find the answers to QA and QM questions that were marked wrong. On your answer sheet beside each question missed, write the numbers of the lines in the text on which you found the answers.

Write the line numbers under "lines" on the answer sheet.

In Step 7 you should read the text as you listen to the tapes. This will enable you to identify words that you did not recognize or hear correctly and to find their meanings. With the aid of the printed text you may find that the speaker did not say what you thought you heard, or mean what you thought he meant.

In this step the tape may be stopped or re-played as often as necessary for you to achieve full understanding. Identifying the line or lines on which the answers to the questions are found provides you with a concrete indication that your understanding is adequate.

Note: The first time through each unit you are strongly advised to follow the program exactly. If your purpose is to acquire the skill of understanding what you hear, this is the most effective procedure. But once you have done this, you may benefit by using the program material in other ways as study material: for example, for further practice in listening, to gain familiarity with the idioms and speech patterns of native English speakers, or to study the content of the talks. For these purposes you may develop self-instructional programs of your own.

APPENDIX II

Samples of the printed program material (Programs 5 and 36)

Unit 5

Educational Development in Southeast Asia

Methods of Change: Part I

IMPORTANT NOTE: Do NOT look at any questions or answer keys until you are told to do so in the instructions which follow.

STEP 1: Listen to the tape once without interruption. Do not stop the tape or play it back. Take notes if you wish. When you come to the end of the tape, stop it, and go to STEP 2, which you will find on the next page.

STEP 2: Answer the questions below (QA), one at a time. Write your answers on the answer sheet. If you do not know the answer to a question, leave the space blank. (In completing this step, do NOT look at the answers on the opposite page and do NOT look at questions below the one you are answering. If necessary, cover them.) When you finish the five questions, go to STEP 3.

QA: Essay Questions

1. How does the speaker describe the general attitude of educators to change?
2. Why should there be a change in the present educational systems in Asia?
3. Name one of the speaker's objections to importing "gadgetry" from elsewhere.
4. Is the speaker opposed to educational technology?
5. Who does the writer say should take the initiative for solving the educational problems of Asia?

STEP 3: Listen to the tape again, several times if necessary. Complete or revise the answers you gave in STEP 2. (Do NOT look at the answer key below, yet.) When you have given the best answers you can, go to STEP 4.

STEP 4: Score your answers to QA, using the key below. Mark an omitted or wrong answer with an X. If you marked no answers wrong, or only one, you have finished the unit. Go to the next unit. If you marked two or more answers wrong, go to STEP 5.

QA Answer Key

1. Conservative OR resistant to change.
2. Present approaches too costly.
3. Innovation should be suited to Asian problems OR gadgetry is usually added to the cost of the existing system.
4. No (but he says it must be used properly and economically).
5. Asians.

STEP 5: Answer the multiple-choice questions (QM) below, on your answer sheet. Do NOT look at the answer key on the opposite page.
When you have answered all of the questions, go to STEP 6.

QM: Multiple Choice Questions

1. According to the speaker, which of the following is the greatest obstacle to change in education? (a) the lack of educators. (b) the lack of equipment. (c) the lack of expertise. (d) the conservative attitude of educators.
2. To solve Asian educational problems, the speaker recommends (a) better funding. (b) educational technology. (c) educational research. (d) greater use of foreign experts.
3. According to the speaker, adding educational technologies to the existing educational system will (a) increase costs. (b) decrease costs. (c) solve the quantitative problem in education. (d) solve the qualitative problem in education.
4. According to the speaker, the underlying problem for Asian education is (a) increasing costs. (b) insufficient teachers. (c) poorly trained teachers. (d) all of these.
5. The speaker believes that Asians may soon be ahead of others in educational innovation because (a) Asians are highly adaptable. (b) Asians are highly resourceful. (c) the greater need will produce solutions in Asia. (d) the pace can be slower in Asia.

STEP 6: Score your answers to QM. Mark errors with an X.

The correct answers are: d, b, a, a, c.

If you made no errors or only one, you have completed the unit.

If you made two or more errors, go to STEP 7, below.

STEP 7: Read the text below as you listen to the tape again.

Read and listen as many times as you wish.

Find the answers to QA and QM questions that you marked X.

On your answer sheet, write the numbers of the lines in the text on which you found these answers.

Educational Development in Southeast Asia

Methods of Change: Part I

I am not foolish enough to propose or to even imply that educational innovation and technology can come quickly or easily. The roots of the educational establishment lie deep, and this is true in any culture--within any national boundary. Educators are generally conservative and resistant to change. And there are vested interests lobbying for maintenance of the status quo. One can see all of these forces at work in the countries now coming to grips with the newer educational technology. But in Asia the alternative to change is perpetuation of "insurmountable" problems, and eventually, quite possibly, educational bankruptcy, for the cost of traditional approaches grows greater each year, and resources for the national investment in education, unfortunately, do not increase proportionately. There simply must be willingness to try new approaches and there must be serious exploration of the newer educational technology to see what it may have to offer. However difficult the achievement of change, a start has to be made.

It would be a mistake, and a serious mistake, to begin simply by importing teaching machines, programed textbooks, educational TV, computers, and the other "gadgetry" developed for use elsewhere and attempting to impose them upon an existing system of education. There are two things wrong with this approach. First, innovation must be suited to Asian problems and needs, if it is to be effective. Second, imposing gadgetry upon the existing system simply adds the cost of the new to the cost of the old. Educational television, for example, used as a supplement to traditional classroom instruction is a luxury few if any Asian countries can afford. But when used to make the skill of the master teacher available to fifty classrooms at a single performance, educational television may become an instrument for change while effecting genuine economies in the cost of education.

It would also be a mistake to start innovation by importing specialists from other countries to do the job for the Asians. Such expertise must be tapped for purposes of training and for dealing with specific problems, but innovation is not a one-shot affair; it is a continuous process, and to insure its continuity Asians themselves must be the innovators; not simply passive onlookers while the job is done for them by outsiders. Indeed, there is good reason to believe that once the situational pre-requisites for innovation are established, the Asians may easily move into the fore-front in the development and practical applications of educational technology and themselves become the sought-after specialists in this movement. The reason for believing this is simply that there is in Asia a far more desperate and urgent need for more efficiency and greater economy in operating the educational establishment than there is in the more affluent societies where the pace can be slower and the conservative elements can be accommodated with more patience. Need breeds effort. Desperate need fosters greater effort.

Unit 36

Introduction to "Evaluation in the Systems Approach", Part I

IMPORTANT NOTE: Do NOT look at any questions or answer keys until you are told to do so in the instructions which follow.

STEP 1: Listen to the tape once without interruption. Do not stop the tape or play it back. Take notes if you wish. When you come to the end of the tape, stop it, and go to STEP 2, which you will find on the next page.

STEP 2: Answer the questions below (QA), one at a time. Write your answers on the answer sheet. If you do not know the answer to a question, leave the space blank. (In completing this step, do NOT look at the answers on the opposite page and do NOT look at questions below the one you are answering. If necessary, cover them.) When you have finished the five questions, go to STEP 3.

QA: Essay Questions

1. What is the theme of this unit?
2. List the two major considerations in evaluating new instructional materials and procedures.
3. How does one select the solution(s) from the list of many possible solutions?
4. According to the speaker, what is the usual procedure for evaluating the effectiveness of new instructional materials?
5. What does a control group study?

STEP 3: Listen to the tape again, several times if necessary.
Complete or revise the answers you gave in STEP 2.
(Do NOT look at the answer key below, yet.)
When you have given the best answers you can, go to
STEP 4.

STEP 4: Score your answers to QA, using the key below.
Mark an omitted or wrong answer with an X.
If you marked no answers wrong, or only one, you have
finished the unit. Go to the next unit.
If you marked two or more answers wrong, go to STEP 5.

QA Answer Key

1. Evaluation (of new instructional materials or techniques).
2. (a) Cost and (b) effectiveness.
3. "Screening" OR "short-listing" OR choosing one or a few
solutions that appear to be most cost-effective.
4. Test learning with the new materials and compare the performance
of the experimental group with a control group.
5. Conventional materials.

STEP 5: Answer the multiple choice questions (QM) below, on your answer sheet. Do NOT look at the answer key on the opposite page.
When you have answered all of the questions, go to STEP 6.

QM: Multiple Choice Questions

1. In this unit the speaker is mainly concerned with (a) evaluation objectives. (b) evaluation design. (c) evaluation problems. (d) evaluation of new instructional materials.
2. This talk is mainly concerned with the evaluation of (a) effectiveness. (b) cost. (c) resources. (d) implementation.
3. In evaluating new materials, (a) we assess the performance of two experimental groups. (b) we assess the performance of two control groups. (c) we compare the performance of the experimental group with a control group. (d) all of these.
4. The control group usually studies (a) methods of controlling costs. (b) conventional materials. (c) methods of controlling materials. (d) new materials.
5. Evaluation is a procedure for determining (a) usefulness. (b) cost. (c) effectiveness. (d) all of these.

STEP 6: Score your answers to QM. Mark errors with an X.

The correct answers are: d, a, c, b, d.

If you made no errors or only one, you have completed the unit.

If you made two or more errors, go to STEP 7, below.

STEP 7: Read the text below as you listen to the tape again.

Find the answers to QA and QM questions that you marked X.

On your answer sheet, write the numbers of the lines in the text on which you found these answers.

Introduction to "Evaluation in the Systems Approach", Part I

By now you will have all seen a list of the steps in the systems approach to solving educational problems, and you have had some practice in starting to solve several problems. Let me review the steps you have already worked with. In the first step, you attempted to define the real problem. Next, you prepared the behavioral objectives or outcomes that a solution to this problem should produce. Then you thought of as many solutions as possible. The rest of the steps in the systems approach are concerned with choosing the best solution, and refining it to make it as effective as possible. Up to now we have not talked very much about how to choose the best solution. When we try to determine how useful a solution is, we say that we are "evaluating" the solution. The procedures that we use to evaluate solutions are "evaluation" procedures. This seminar is about evaluation procedures. That is, it is about procedures that we use to decide on the usefulness of solutions.

Now, "evaluation" is a very general term. We may want to evaluate different arrangements of office space. We may want to evaluate the effectiveness of a newsletter. We may want to evaluate a new type of instructional materials. In fact, we should probably evaluate any new materials, procedures, programs, etc. that we use. Many of the evaluation procedures that we talk about in this seminar are very general. They can be applied to many types of problems. I suspect, however, that in the beginning, it will be easier to understand the procedures if we think of them in relation to specific examples. So from now on in this seminar, I will talk mainly about evaluating new instructional materials or techniques. In other words, I will talk about procedures to use in deciding whether a set of new materials is useful at all, whether it is better than conventional materials, or whether it is better than some other set of new materials.

Let me be even more specific as to what we will cover in this seminar. In evaluating new materials, we are usually concerned with two major questions:

- 35 1. How much does it cost?
 2. How effective is it in the situation where we want to use
 it?

Both questions are equally important, but in this seminar we will be concerned mainly with how to evaluate the effectiveness of
40 materials.

I should also make it very clear that the procedures we will be discussing are complex and time consuming. Because so much time and money are required to do a careful evaluation of even one set of materials, it is never possible to apply detailed evaluation
45 procedures to all the possible solutions that we can think of. Instead, after we have completed our list of possible solutions, we "screen", or "short-list" the solutions to select one, (or possibly two or three) solutions that appear to be the best ones in terms of cost and effectiveness. In preparing the short-list
50 we may have to rely on rough estimates, and educated guesses. Then we go through our careful evaluation procedures to get precise information on how effective the materials are.

In general, the procedure for evaluating the effectiveness of new materials is this: we choose a group of students to study the new
55 materials, and after they have completed the materials, we give them a test to see how much they have learned. Usually we pick one or more other groups that study the same subject by conventional or alternate methods, so that we can compare the new method with the conventional method. The group of students that uses the new
60 materials is called the "experimental" group. The groups that study the conventional materials for comparison are called the "control" groups.